Citation:

Goss J, Grubbs L. Comparative analysis of body mass index, consumption of fruits and vegetables, smoking, and physical activity among Florida residents. *J Community Health Nurs*. 2005 Spring; 22 (1): 37-46.

PubMed ID: 15695195

Study Design:

Cluster Randomized Trial

Class:

A - Click here for explanation of classification scheme.

Research Design and Implementation Rating:

NEUTRAL: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

To compare body mass index (BMI), consumption of fruits and vegetables, smoking, and physical activity among residents of the seven Florida counties with the highest reported BMI to residents of the seven Florida counties with the lowest reported BMI.

Inclusion Criteria:

- A representative sample from each Florida county's non-institutionalized civilian residents aged 18 years or older, with one member per household surveyed
- Participants must have a land line telephone
- The sample used for this analysis was limited to the seven counties with the highest mean BMI and the seven counties with the lowest mean BMI.

Exclusion Criteria:

None specified.

Description of Study Protocol:

Recruitment

Self-reported county-specific data obtained from the Florida 2002 BRFSS survey.

Design

- The BRFSs uses a multistage cluster design based on random-digit dialing to select a representative sample from each county's non-institutionalized civilian residents aged 18 years or older, with one member per household surveyed

- Retrospective, non-experimental descriptive analysis of multivariate data.

Dietary Intake/Dietary Assessment Methodology

- RQ 6: When controlled for physical activity, in those seven counties with the highest and lowest mean BMI, was there a correlation between BMI and consumption of fruits and vegetables?
- RQ 7: When controlled for smoking, in those seven counties with the highest and lowest mean BMI, was there a correlation between BMI and consumption of fruits and vegetables?

Blinding Used

Not applicable.

Intervention

Not applicable.

Statistical Analysis

- Retrospective, non-experimental descriptive analysis of multivariate data.
- For Q 1-5: Descriptive statistics included frequencies, relative frequencies, cumulative frequencies, percentages, percentiles, and correlation measures. For BMI, the arithmetic mean and median were provided as measures of central location. Dispersion measures (e.g., standard deviations) were applied
- For Q 6-7: Comparison of means. The size of the mean difference was the indicator of the differences when the data revealed distributions that were skewed, then medians were compared and the size of the median difference was the indicator of the differences. These questions analyzed the relation of BMI with consumption of fruits and vegetables, smoking patterns, and physical activity. This analysis utilized contingency coefficients, Chi square analysis with the alpha level of 0.05. The research question was answered using arithmetic means and descriptive analysis of data differences relative to BMI, fruit, and vegetable consumption, smoking patterns, and physical activity.

Data Collection Summary:

Timing of Measurements

2002 Florida BRFSS; cross-sectional survey.

Dependent Variables

BMI.

Independent Variables

Smoking, physical activity, consumption of fruits and vegetables

Control Variables

None.

Description of Actual Data Sample:

- *Initial N:* 34, 551 total respondents for the 2002 Florida BRFSS survey
- *Attrition (final N):* The seven counties with the highest mean BMI (N=3,559) and the seven counties with the lowest mean BMI (N=3,501)
- *Age:* 18 years or older
    - Four categories (years)
        - 18-34
        - 35-49
        - 50-64
        - 65-99
- *Ethnicity:*
    - Non-Hispanic White
    - Non-Hispanic Black
    - Hispanic
- *Other relevant demographics:* None
- *Anthropometrics:* None
- *Location:* Florida.

Summary of Results:

Fruit and Vegetable Consumption Percentages in Seven Counties with Highest Mean BMI

	kg/m^2	Fruit	Vegetable	Consumption	Per Day
County	Mean BMI	<1	1 to <3	3 to <5	5+
Hardee	28.24	4.6	34.9	37.5	23.0
Jefferson	28.21	4.1	34.2	36.2	25.6
Liberty	28.16	7.4	37.6	33.3	21.9
Gadsden	27.92	5.1	32.8	37.3	24.8
Madison	27.88	4.3	33.3	39.1	23.3
Union	27.84	4.8	38.3	37.3	19.6
Washington	27.80	3.9	37.9	35.3	22.9
Average	28.00	4.9	35.6	36.6	23.0

Fruit and Vegetable Consumption Percentages in Seven Counties with Lowest Mean BMI

	kg/m^2	Fruit	Vegetable	Consumption	Per Day
County	Mean BMI	<1	1 to <3	3 to <5	5+
Collier	25.5	2.6	27.1	41.8	28.5
Alachua	25.68	3.8	30.1	38.2	27.9
St. Johns	25.69	2.6	26.1	40.9	30.5
Martin	25.74	3.1	24.6	39.3	33.0
Seminole	25.85	2.6	32.3	41.2	23.9
Sarasota	25.93	1.8	26.1	43.6	28.5

Flagler	26.01	2.0	27.8	40.9	29.3
Average	25.78	2.6	27.7	40.8	28.8

Author Conclusion:

- Participants in counties with the lowest mean BMI consumed significantly more fruits and vegetables, compared to respondents in counties with the highest BMI
- A positive relation between mean BMI and consumption of fruits and vegetables remained when controlled for physical activity, but not for smoking.

Reviewer Comments:

None.

Research Design and Implementation Criteria Checklist: Primary Research

Relevance Questions

1.	Would implementing the studied intervention or procedure (if found successful) result in improved outcomes for the patients/clients/population group? (Not Applicable for some epidemiological studies)	Yes
2.	Did the authors study an outcome (dependent variable) or topic that the patients/clients/population group would care about?	Yes
3.	Is the focus of the intervention or procedure (independent variable) or topic of study a common issue of concern to nutrition or dietetics practice?	Yes
4.	Is the intervention or procedure feasible? (NA for some epidemiological studies)	N/A

Validity Questions

1.	**Was the research question clearly stated?**	Yes
1.1.	Was (were) the specific intervention(s) or procedure(s) [independent variable(s)] identified?	Yes
1.2.	Was (were) the outcome(s) [dependent variable(s)] clearly indicated?	Yes
1.3.	Were the target population and setting specified?	Yes
2.	**Was the selection of study subjects/patients free from bias?**	No
2.1.	Were inclusion/exclusion criteria specified (e.g., risk, point in disease progression, diagnostic or prognosis criteria), and with sufficient detail and without omitting criteria critical to the study?	???

2.2.	Were criteria applied equally to all study groups?	N/A
2.3.	Were health, demographics, and other characteristics of subjects described?	Yes
2.4.	Were the subjects/patients a representative sample of the relevant population?	No
3.	**Were study groups comparable?**	N/A
3.1.	Was the method of assigning subjects/patients to groups described and unbiased? (Method of randomization identified if RCT)	N/A
3.2.	Were distribution of disease status, prognostic factors, and other factors (e.g., demographics) similar across study groups at baseline?	N/A
3.3.	Were concurrent controls used? (Concurrent preferred over historical controls.)	Yes
3.4.	If cohort study or cross-sectional study, were groups comparable on important confounding factors and/or were preexisting differences accounted for by using appropriate adjustments in statistical analysis?	???
3.5.	If case control or cross-sectional study, were potential confounding factors comparable for cases and controls? (If case series or trial with subjects serving as own control, this criterion is not applicable. Criterion may not be applicable in some cross-sectional studies.)	N/A
3.6.	If diagnostic test, was there an independent blind comparison with an appropriate reference standard (e.g., "gold standard")?	N/A
4.	**Was method of handling withdrawals described?**	N/A
4.1.	Were follow-up methods described and the same for all groups?	N/A
4.2.	Was the number, characteristics of withdrawals (i.e., dropouts, lost to follow up, attrition rate) and/or response rate (cross-sectional studies) described for each group? (Follow up goal for a strong study is 80%.)	N/A
4.3.	Were all enrolled subjects/patients (in the original sample) accounted for?	N/A
4.4.	Were reasons for withdrawals similar across groups?	N/A
4.5.	If diagnostic test, was decision to perform reference test not dependent on results of test under study?	N/A
5.	**Was blinding used to prevent introduction of bias?**	N/A
5.1.	In intervention study, were subjects, clinicians/practitioners, and investigators blinded to treatment group, as appropriate?	N/A

5.2.	Were data collectors blinded for outcomes assessment? (If outcome is measured using an objective test, such as a lab value, this criterion is assumed to be met.)	Yes
5.3.	In cohort study or cross-sectional study, were measurements of outcomes and risk factors blinded?	N/A
5.4.	In case control study, was case definition explicit and case ascertainment not influenced by exposure status?	N/A
5.5.	In diagnostic study, were test results blinded to patient history and other test results?	N/A
6.	**Were intervention/therapeutic regimens/exposure factor or procedure and any comparison(s) described in detail? Were interveningfactors described?**	N/A
6.1.	In RCT or other intervention trial, were protocols described for all regimens studied?	N/A
6.2.	In observational study, were interventions, study settings, and clinicians/provider described?	Yes
6.3.	Was the intensity and duration of the intervention or exposure factor sufficient to produce a meaningful effect?	Yes
6.4.	Was the amount of exposure and, if relevant, subject/patient compliance measured?	Yes
6.5.	Were co-interventions (e.g., ancillary treatments, other therapies) described?	N/A
6.6.	Were extra or unplanned treatments described?	N/A
6.7.	Was the information for 6.4, 6.5, and 6.6 assessed the same way for all groups?	Yes
6.8.	In diagnostic study, were details of test administration and replication sufficient?	N/A
7.	**Were outcomes clearly defined and the measurements valid and reliable?**	Yes
7.1.	Were primary and secondary endpoints described and relevant to the question?	Yes
7.2.	Were nutrition measures appropriate to question and outcomes of concern?	Yes
7.3.	Was the period of follow-up long enough for important outcome(s) to occur?	N/A
7.4.	Were the observations and measurements based on standard, valid, and reliable data collection instruments/tests/procedures?	Yes
7.5.	Was the measurement of effect at an appropriate level of precision?	Yes
7.6.	Were other factors accounted for (measured) that could affect outcomes?	N/A
7.7.	Were the measurements conducted consistently across groups?	N/A

8.	**Was the statistical analysis appropriate for the study design and type of outcome indicators?**	Yes
8.1.	Were statistical analyses adequately described and the results reported appropriately?	Yes
8.2.	Were correct statistical tests used and assumptions of test not violated?	Yes
8.3.	Were statistics reported with levels of significance and/or confidence intervals?	Yes
8.4.	Was "intent to treat" analysis of outcomes done (and as appropriate, was there an analysis of outcomes for those maximally exposed or a dose-response analysis)?	N/A
8.5.	Were adequate adjustments made for effects of confounding factors that might have affected the outcomes (e.g., multivariate analyses)?	Yes
8.6.	Was clinical significance as well as statistical significance reported?	Yes
8.7.	If negative findings, was a power calculation reported to address type 2 error?	No
9.	**Are conclusions supported by results with biases and limitations taken into consideration?**	Yes
9.1.	Is there a discussion of findings?	Yes
9.2.	Are biases and study limitations identified and discussed?	Yes
10.	**Is bias due to study's funding or sponsorship unlikely?**	Yes
10.1.	Were sources of funding and investigators' affiliations described?	Yes
10.2.	Was the study free from apparent conflict of interest?	Yes